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EXAMINER

COLLINS, SCOTT M

ART UNIT

PAPER NUMBER

2143

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/587,113	SAULPAUGH ET AL.	
	Examiner	Art Unit	
	Scott M. Collins	2143	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>516,173</u> | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

1. Claims 1-55 examined.
2. It is hereby acknowledged that the following papers have been received and placed of record in the file: Declaration and Fee on 10/06/2000, Power of Attorney on 11/22/2001, and four Information Disclosure Statements on 08/06/2001, 08/16/2001, 09/17/2001, and 12/27/2002 respectively.

Information Disclosure Statement

3. It should be noted that the applicant has submitted an exorbitant amount of prior art on numerous PTO-1449 documents that on initial consideration appears to not all have relevancy or pertinence to the instant invention as claimed. In view of this, the examiner wishes to make it known that his determination of the relevance of these documents is based upon a quick scan of the titles, abstracts, summaries, etc. of the documents. Thus, while no rejection has been made in this action that utilizes a document from the Information Disclosure Statement, the examiner reserves the right to utilize these documents at a later date. The applicant is requested in response to this office action to point out which of these numerous prior art are pertinent or relevant to the patentability of the invention as claimed in this instant application. It should be noted that it would be advantageous to the applicant to provide a concise explanation of why each of the prior art is being submitted and how it is understood to be relevant. "Concise explanations are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of a section that is highly relevant to patentability or where a large number of documents are submitted and applicant is aware that one or more are highly relevant to patentability." (See MPEP 609 under subheading "A. CONTENT").

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-12, 15, 16-23, 25-36, 41-44, 46-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Sun et al., U.S. Patent 6,442,663 B1 (herein referred to as Sun).

6. Referring to claim 1, Sun has taught a method for migrating a process between devices, the method comprising:

a. executing the process within a first device (Sun column 1, line 57 – column 2, line 19; and column 8, lines 4-35);

b. storing a first state of the process executing within the first device to a persistent store (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; and column 8, lines 4-35);

c. expiring one or more leases to services for the process on the first device (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; and column 8, lines 4-35 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored” and this would thus include every service in which the process was involved.);

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- d. sending the first state of the process from the persistent store to a second device (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; and column 8, lines 4-35);
 - e. receiving the first state of the process on the second device (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; and column 8, lines 4-35);
 - f. reconstituting the first state of the process on the second device (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; and column 8, lines 4-35);
 - g. establishing the one or more leases to services for the process on the second device (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; and column 8, lines 4-35 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored” and this would thus include every service in which the process was involved.);
 - h. and resuming the process execution on the second device (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; and column 8, lines 4-35).
7. Referring to claim 2, Sun has taught the method further comprising: storing one or more previous states of the process executing within the first device to the persistent store prior to said sending the stored state of the process to the second device wherein the previous states include the first state; stopping the process execution on the second device; selecting one of the one or more previous states of the process executing within the first device from the persistent store; reconstituting the selected previous state of the process on the first device; establishing the one or more leases to services for the process on the first device; resuming the process execution on

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the first device (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; and column 8, lines 4-35).

8. Referring to claim 3, Sun has taught the method wherein the first state of the process comprises a heap for the process, wherein the heap comprises code and data for the process executing within the first device (Sun column 2, lines 60-65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

9. Referring to claim 4, Sun has taught the method wherein the first state of the process comprises data describing the one or more leases to services for the process on the first device, wherein the data describing the one or more leases is used in said establishing the one or more leases to services for the process on the second device (Sun column 2, lines 60-65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

10. Referring to claim 5, Sun has taught the method wherein the one or more leases to services include one or more leases to remote services, wherein the remote services are services provided on devices other than the device within which the process is currently executing (Sun column 2, lines 60-65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

11. Referring to claim 6, Sun has taught the method wherein the one or more leases to services include one or more leases to local services, wherein the local services are services provided on the device within which the process is currently executing (Sun column 2, lines 60-

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65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

12. Referring to claim 7, Sun has taught the method wherein the one or more leases to services include one or more leases to system services, wherein a system service comprises system code for accessing a resource external to the process, wherein the system code is provided on the device within which the process is currently executing (Sun column 2, lines 60-65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

13. Referring to claim 8, Sun has taught the method wherein the first state of the process comprises a stored execution state of the first device; wherein, in said reconstituting the first state of the process on the second device, a current execution state of the second device is reconstituted to the stored execution state of the first device (Sun column 2, lines 60-65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

14. Referring to claim 9, Sun has taught the method wherein said reconstituting the first state of the process on the second device comprises recalculating one or more transient variables for the process (Sun column 2, lines 60-65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

15. Referring to claim 10, Sun has taught the method wherein the persistent store comprises one or more persistent heaps for one or more processes; and wherein said storing the first state of the process on the first device to the persistent store comprises storing the first state of the process on the first device to a first persistent heap for the process in the persistent store (Sun

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column 2, lines 60-65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored” and where each persistent store must have at least one persistent heap.).

16. Referring to claim 11, Sun has taught the method wherein said sending the first state of the process from the persistent store to the second device comprises sending the first state of the process from the first persistent heap to the second device (Sun column 2, lines 60-65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

17. Referring to claim 12, Sun has taught the method wherein said sending the first state of the process from the persistent store to the second device comprises sending a copy of the first persistent heap to the second device; wherein said receiving the first state of the process on the second device comprises receiving the copy of the first persistent heap on the second device; and wherein said reconstituting the first state of the process on the second device comprises creating a second persistent heap for the process on the second device from the received copy of the first persistent heap (Sun column 2, lines 60-65; and column 6, lines 10-23 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

18. Referring to claim 15, Sun has taught the method wherein said storing the first state of the process on the first device to the persistent store, said sending the first state of the process from the persistent store to the second device and said receiving the first state of the process on the second device are performed as elements of an atomic transaction; the method further comprising: committing the atomic transaction on the first device and the second device if all the elements of the atomic transaction complete successfully, wherein committing the atomic

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transaction comprises accepting changes to data made by the elements of the atomic transaction; and rolling back the atomic transaction if one or more of the elements of the atomic transaction fail, wherein rolling back the atomic transaction comprises restoring the data modified by the elements of the transaction to a previous state of the data prior to the start of the atomic transaction (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; and column 8, lines 4-35 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored” and where the entire task of migrating a process has simply been defined as an atomic transaction which inherently only takes place if all of the component tasks can complete successfully.).

19. Referring to claim 18, Sun has taught the method wherein the persistent store is on a server external to the first device and the second device; and wherein the first device and the second device are coupled to the server via the Internet (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; column 8, lines 4-35; and column 1, line 15 where “information superhighway is a common euphemism for the Internet.).

20. Referring to claim 19, Sun has taught the method wherein the first device and the second device each comprise a network service connection system configured to access services by establishing leases to the services; and wherein the one or more leases are expired on the first device and established on the second device using the network service connection system on the devices (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; column 8, lines 4-35; and column 1, line 15 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

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21. Referring to claim 20, Sun has taught the method wherein the first device and the second device each comprise a compact network service connection system configured to execute on mobile computing devices to access services by establishing leases to the services; and wherein the one or more leases are expired on the first device and established on the second device using the compact network service connection system on the devices (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; column 8, lines 4-35; and column 1, line 15 where as Sun notes “all data necessary for future execution of the process has to be collected and then restored”).

22. Referring to claim 21, Sun has taught the method wherein the first device and the second device are coupled via the Internet so that the process is migrated from the first device to the second device over the Internet (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; column 8, lines 4-35; and column 1, line 15 where “information superhighway is a common euphemism for the Internet.”).

23. Referring to claim 22, Sun has taught the method wherein the first device and the second device are network client devices (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; column 8, lines 4-35; and column 1, line 15).

24. Referring to claim 23, Sun has taught the method wherein at least one of the first device and the second device is a mobile computing device (Sun column 1, line 57 – column 2, line 19; column 2, lines 60-65; column 6, lines 10-23; column 8, lines 4-35; and column 1, line 15).

25. Claims 25-36, and 41-44 do not recite limitations above the claimed invention set forth in claims 1-12, 21-23, and 18 respectively and are therefore rejected for the same reasons set forth in the rejection of claims 1-12, 21-23, and 18 respectively above.

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26. Claims 46-53 do not recite limitations above the claimed invention set forth in claims 1-12 and are therefore rejected for the same reasons set forth in the rejection of claims 1-12 above.

Claim Rejections - 35 USC § 103

27. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

28. Claims 13, 14, 16, 17, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al., U.S. Patent Number 6,442,663 B1 (herein referred to as Sun) in view of Cejtin et al., U.S. Patent Number 5,745,703 (herein referred to as Cejtin).

29. Sun has not expressly disclosed the elements of claims 13, 14, 16, 17, and 24. Cejtin has taught the elements as shown below.

30. Referring to claim 13, Cejtin has taught the method: wherein the first device comprises a first in-memory heap for caching pages for use by the process, wherein the pages comprise code and data for the process; wherein the persistent store comprises a first virtual heap for storing pages flushed from the first in-memory heap; wherein said storing the first state of the process on the first device to the persistent store comprises storing one or more pages from the first in-memory heap to the first virtual heap in the persistent store; wherein said sending the first state of the process from the persistent store to the second device comprises sending a copy of the first virtual heap from the persistent store to the second device (Cejtin figure 19; column 1, lines 55-61; and column 2, lines 48-59).

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31. Referring to claim 14, Cejtin has taught the method wherein said reconstituting the first state of the process on the second device comprises: establishing on the second device a second in-memory heap for caching pages for use by the process; and copying the one or more pages stored from the first in-memory heap to the first virtual heap from the received copy of the first virtual heap to the second in-memory heap (Cejtin figure 19; column 1, lines 55-61; and column 2, lines 48-59).

32. Referring to claim 16, Cejtin has taught the method wherein the process is executing within a first virtual machine on the first device; and wherein said resuming the process execution on the second device comprises resuming the process execution on a second virtual machine on the second device (Cejtin figure 19; column 1, lines 55-61; and column 2, lines 48-59).

33. Referring to claim 17, Cejtin has taught the method wherein the first virtual machine and the second virtual machine are Java virtual machines (Cejtin figure 19; column 1, lines 55-61; and column 2, lines 48-59).

34. Referring to claim 24, Cejtin has taught the method wherein the process is a Java process (Cejtin figure 19; column 1, lines 55-61; and column 2, lines 48-59).

35. All of claims 13, 14, 16, 17, and 24 are directed to virtual heaps, virtual machines, and utilizing Java. In all of these cases, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to utilize virtual heaps, virtual machines, and Java because as Cejtin notes “Java is a byte-coded system intended to work in heterogeneous distributed environments ... [and] Java allows byte-codes to be transmitted across nodes” (Cejtin column 1, lines 55-61). One of ordinary skill in the art would have been motivated to do this in

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order to create a system that is capable of running no matter what operating systems or devices are in use.

Conclusion

36. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


- a. Wollrath et al., U.S. Patent Number 5,832,529, have taught requesting and releasing leases in full.
- b. Seymour, U.S. Patent Number 5,109,486, has taught virtual machines in use in a distributed computer system.
- c. Jagannathan et al., U.S. Patent Number 6,496,871 B1, have taught network process migration utilizing Java virtual machines.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott M. Collins whose telephone number is 703.305.7865. The examiner can normally be reached on Mon.-Fri. 8:00 am - 5:30 pm with alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A Wiley can be reached on 703.308.5221. The fax phone numbers for the organization where this application or proceeding is assigned are 703.746.7239 for regular communications and 703.746.7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.3900.

smc
July 25, 2003


DAVID WILEY
SUPERVISORY PATENT EXAMINER
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